Red Rock Lakes NWR - Narrative Report -
1969

N A R R A T I V E R E P O R T

F O R

RED ROCK LAKES NATIONAL WILDLIFE REFUGE

January 1, to December 31, 1969

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

MONIDA, MONTANA

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I GENERAL

A. Weather Conditions

Snowfalls to the beginning of the year totaled 20 inches, slightly above normal. Not long into January we had an indication of what to expect for the winter. Nine inches of snow on the ground at the beginning of the month grew to 40 inches by the end. Almost 80 inches fell during this time. February, March, and April added 25 inches.

On the two snowcourses above refuge headquarters the snowfall was the heaviest ever recorded. Lakeview Ridge with a water content of 24.2 inches and Lakeview Canyon with a water content of 21.0 inches were 77% and 79% higher than last year's snowpack and 110% above the average. The snowfall was well over 200 inches on these two areas.

If the snows were often and deep, the temperatures were mild. The lowest temperature for the year was -27°(this year we've already had lows below -30°).

Sandhill cranes traditionally herald the coming spring. This year they arrived March 30, almost two weeks earlier than normal. May was warm and dry and by the end of the month only the deepest drifts remained on the valley floor.

Fall was pleasantly mild with little snow. So little that we were able to travel in the valley with wheeled vehicles to the end of December.

With mild temperatures and copious snowfalls it might have been a good weather year. Unfortunately aperiod of 11 days during the last of June and first of July which brought freezing temperatures and over an inch of rain proved disastrous to this year's trumpeter swan cygnets. The cygnets couldn't cope with the prolonged rain and low temperatures and about 90% died.

WEATHER 1969

	Temperatures					Precipitation		
Month	Max.	Ave.	Min.	Ave.	Month Mean	Moisture	Normal	Diviation From Normal
January	40	27	-18	8	17	7.51	1.97	5.54
February	39	25	-19	5	15	1.05	1.29	- .24
March	51	28	-27	- 2.6	13	.15	1.50	-1.35
April	65	47	16	24	35	.77	1.40	- .63
May	73	63	21	32	47	.97	2.55	-1.58
June	80	63	25	34	48	2.84	2.67	- .17
July	83	75	31	43	59	1.12	1.18	- .60
August	88	81	30	40	60	.16	1.32	-1.16
September	82	69	23	34	51		1.50	-1.50
October	62	46	2	19	65	.48	1.31	- .83
November	65	39	- 1	13	26	1.58	1.22	.36
December	42	27	- 14	2	14	.61	1.64	- .03
					TOTALS	17.24	19.55	
EXTREMES	88		- 27			7.51		

Chart I

B. Habitat Conditions

Water

Of course with the heavy snows of the winter we had plenty of water throughout the summer. Lower Lake water levels were the same as 1968 during the peak runoff months of April and May but remained about 10 inches higher throughout June and July. Water levels returned to normal in August (approximately 8 inches above crest elevation).

Spring and summer rains came at the right times for excellent range grass production and contributed 6.86 inches to the total annual precipitation of 17.24 inches. However, the snowpack, as it slowly melted was primarily responsible for maintaining stream flows during the summer. Small streams and springs that are usually dry by the middle of August kept flowing all summer.

Water flowing into the refuge was measured at 27 different locations and totaled 160,963 acre feet. Of this, 38,063 acre feet were diverted over refuge grasslands to improve habitat, increase forage production, and establish a history of water use. Water diversion during the heavy runoff in the spring also reduced the amount of silt reaching the lakes and spreaded it harmlessly (and probably with some benefit) over the rangelands.

Food and Cover

The heavy snows on the uplands knocked all but the coarsest rye grasses and scattered sagebrush plants to the ground leaving sparse nesting habitat for waterfowl. Upland nesters found nesting sites in extensive stands of sedges (Carex) and rushes (Juncus) on hummocks and islands of high ground.

Over-water nesters found emmergents dense and extensive throughout Upper and Lower Lakes and the Rivermarsh. Water Levels in the marsh reached maximum height soon after iceout and steadily lowered without flooding nests.

Timely rains in June and July stimulated grass production for excellent summer cover on the uplands. While too late for nesting waterfowl it proved an excellent nursery for sandhill cranes, foxes, antelope, skunks, and badgers.

Aquatic plant production this year in Lower Lake compares favorably with 1967 (15.5 tons in 1967; 16 tons in 1969). A change in species composition was noted, but may be due more to sampling techniques than actual changes in the plant community.

Results of the 1966 and 1968 aquatic plant surveys of Upper Lake, and Culver, Widgeon, and Shambow Ponds show excellent production of desirable pondweeds (*Elodea*, *Potamogeton pectinatus* which appear to be preferred by swans over several other aquatic plant species). Total plant production ranged from 7.5 tons per acre in Upper Lake to 62 tons per acre in Culver Pond.

Information gathered to date indicates present water management favors copious aquatic plant growth. Shifts in species compostion are often subtle and not enough data have been gathered to show any definite changes.

II WILDLIFE

A. Migratory Birds

Trumpeter Swan

Total trumpeter swan use-days for the year were 85,050, compared to 88,711 in 1968 and 91,105 in 1967, differences of 4.2% and 6.7%. Peak numbers of 330 occurred during January, February and March when we were feeding at MacDonald and Culver Ponds.

The high of 1967 reflects a high use of Upper Lake by nonbreeding subadults. Whereas in 1968 and again in 1969 the nonbreeders moved 20 miles west to spend most of the summer on Lima Reservoir. Often, high use figures for the fall and winter period reflect uses of the refuge feeding stations during severe weather rather than changes in population levels.

The highest number of nesting pairs (60) were found in 1966 and 1968 while in 1967, the highest use year, 53 pairs were noted and total production for the year was only 20. The tri-state census for 1967 was lower than 1968, 535 and 585, and lower than any year since 1962. A look at data gathered since 1936 may give a clearer picture of the present status of refuge swan populations than do either use-days or production figures.

In 1936 the tri-state (Montana, Idaho, and Wyoming) census showed a swan population of 111 for the lowest count made on the census. Subsequent counts show a steady upward trend. The population reached 200 by 1941, 300 by 1946, 400 by 1949, and 500 by 1951 when the tri-state census revealed 543 birds. The average populations since then have been 568 with extremes in numbers ranging from 448 in 1957 to 651 in 1954. The population in 1968 was only 42 birds higher than the 1951 population of 543 birds. This shows that the tri-state population reached a saturation point in 1951 with no apparent trends either up or down since then.

The steady increase in the continental trumpeter swan populations since 1951 is due to the success of transplants, increase in captive birds, and increase in the Canada and Alaska birds.

Ever since population data has been recorded, the tri-state population has shown a steady drain that seems too high to be attributed to mortality. In the five-year period 1937-1940 the number of all-white birds that were found in

the following year's population was 31% less than expected. In subsequent five periods the mean annual loss of projected birds has averaged 14%. In other words, from the time that the birds were counted in the fall until the next fall census all-white birds (over a year old) had a mean annual loss of 14%. This seems excessively high to be attributed soley to mortality and shows a life expectancy of only 7 years. Part of this loss may be attributed to birds being forced to venture farther afield, than we think, in search of suitable nesting habitat. A four year neck banding program did not resolve this speculation.

Although refuge populations show an increase in numbers and a levelling off in 1951 similar to that for the tri-state population, yearly increases in cygnet production to flight stage are not so well defined. During the five-year period 1964-1968 average annual cygnet production was 40. But in the five-year period 1937-1941 average annual cygnet production was actually higher at 49. There is also more variance in later cygnet production: 22, 16, 54, 20, 90 for the 1964-1968 period; 51, 42, 59, 48, 44, for the 1937-41 period.

This data raises many questions. Perhaps, in cooperation with other workers and agencies, we may find the answers.

Transfers

Seventeen trumpeter swans were transferred this summer: two to the Charles M. Russel Game Range; four to the Nebraska Game and Parks Commission; 2 to Crane Creek Wildlife Experimental Station; 7 to four different zoological gardens; 2 to a private aviary in California. Six are now dead.

One bird, shipped air express died en route. Two birds sent to Ohio by air express took 58 hours getting to their destination, one died a short time after arriving. Four birds, two adults and two cygnets, were picked up in Idaho Falls and flown directly by private plane to Nebraska. Both cygnets and one adult died. One of the Charles M. Russel birds died.

We recommend that the trumpeter swan transfer program be closely reviewed. All future transfers should be restricted to the establishment of breeding flocks and the recipients should pick up the swans at the refuge and transport them in proper carrying facilities. All other future requests should by filled by zoological gardens.

Whistling Swan

On the morning of October 29 Lower Lake was resplendent with white as 1,500 whistling swans came to rest on the ice. For two weeks they remained in these numbers.

They filled the air with their loud, musical calls as they circled in groups of 50 to 100 reaching to the tops of the mountains before swinging south into Idaho. This same circuitous route was followed again in late afternoon as they streamed back into the valley. For a few short weeks they took over the valley, appropiated the choicest resting places, and drowned out the protests of their larger cousins. By November they were gone.

Swan Use-Days

Year	Use-Days	Year	Use-Days
1965	25,920	1968	28,000
1966	38,920	1969	26,250
1967	8,393		

Geese

Thirteen pairs of Canada geese were counted on the refuge on April 29. Eleven broods, with a total of 48 goslings, and one abandoned nest with 8 eggs were subsequently located. Last year's production was 87, and production in 1967 was 100.

Total use-days were in keeping with the steady downward trend since 1965 but at 54,740 were 14% above the 1968 total of 47,159. In 1965 use-days were 120,036.

Most of the use is from nonbreeding moulters on Upper Lake in the summer and migrants on the ponds in the fall. Approximately 5,000 moulting geese spent the summer on Lima Reservoir, 20 miles west of the refuge. Whenever some of these birds from Lima choose to stay on Upper Lake during the moult, use-days go up. This is what happened in 1965 and in 1959 when the record high was set at 210,000 use-days.

Snow geese were not seen this year but a report from a hunter of several, large, white birds with black wingtips suggests at least a passing visit from these birds during October.

Ducks

Use-days for the year were 4,742,395, down from last year by 47% and down from all recent years except 1965 which was similar to this year both in total use-days and production.

The peak was 66,550 and in August. In 1968 the peak was 97,100 and in 1967 it was 112,710.

An early movement of widgeon and coots was the only real evidence of the fall migration. Substantial mallard, and redhead movement through the area failed to materialize before ice-up in October.

Both mallard and redhead summer populations were down by about 50% from the previous year. Mallard numbers were down by about a third and redheads by 85% during the fall period. Widgeon numbers were little changed from last year (1,399,500 in 1969; 1,662,535 in 1968).

Duck production was 4,956 this year - 36% less than 1968 (7,770) but similar to 1967 (5,130) and 1965 (5,525). Time of ice-out is the main factor in determining the refuge breeding population and ultimate production.

The most common nesters this year in order of number of ducklings produced, were lesser scaup, redheads, mallards, ruddy ducks, ring-necked ducks, shovelers, gadwall, and pintails. Scaup, redheads and mallards made up almost half of the total production.

In all, 16 different species nested on the refuge.

Duck nesting is later in this high mountain valley than most places. Pair counts are made during the last week of May and the second week of June. Brood counts are made during July. We saw a brood of 5 ducklings (unidentified) on Elk Creek on June 1. They were 16 days ahead of the next brood sighting - 4 Barrows Goldeneyes. At the end of June, mallards and pintails, newly hatched, began popping out all over. Redheads and scaup came off mostly in July.

In August we came upon a lesser scaup swimming in Elk Creek, below Swan Lake, followed by a knot of 22 ducklings. She was alone and the birds were the same age and all stayed together as one brood. As we passed the brood they scattered into the sedge and dove while the hen desperately led us off. She was never joined by another hen.

Coots

If duck production was poor, coot production was excellent. Total production was 5,526, 22% above last year, 28% above the next highest year of the 60's. Brood and population counts became monotonous with coots.

Use-days for the year were 1,886,990. Coots peaked in September at 30,000, fell to 250 at the end of October and by November were gone.

White Pelican

Ten pelicans arrived on May 29. They increased to 400 and stayed in these numbers throughout the summer. They spent most of their time when they were not fishing in the lakes or on Lima Reservoir sitting on the dike on the west end of Lower Lake with about 200 California Gulls. Occassionally a bittern joined the outer edge of the gathering. They moved off in September ahead of the cold.

Greater Sandhill Crane

Valley and refuge residents have always welcomed the arrival of the first cranes. Traditionally, they herald the coming of spring and the end of the often too-long, too-cold winters. This year they were first observed on the refuge on March 30, one of the earliest arrival dates in years.

Migrating cranes come into the valley from the south over the continental divide. They appear in the lower valley first and gradually move onto the refuge as the snow receedes.

They begin their fall movement during the last of August. By the end of September all of the cranes have usually left the refuge but a few may remain in the lower valley. This year they were gone by September 30.

Refuge utilization patterns are seasonal and dependent on land use. The heaviest use in the spring is concentrated between Red Rock Creek and Widgeon Pond. During the summer and fall the birds are spread uniformally over the upland meadows with some concentrations along Tom and O'dell Creeks. However, response to a food source will concentrate cranes on specific areas of the refuge and disrupt their normal distribution patterns. This happens most frequently with grasshopper outbreaks in late summer.

Crane populations for the last several years have been:

Year	Adult	Young	Total
1959	-	-	400
1960	293	7	300
1961	212	10	222
1962	184	2	186
1963	154	8	162
1964	278	12	290
1965	228	8	236
1966	250	14	264
1967	194	16	210
1968	202	28	230
1969	282	22	304
Average	228	13	255

A sandhill crane marked with a yellow neck band was observed west of the refuge. It was one of a mated pair that successfully raised two chicks. Banded cranes observed in past years were banded in New Mexico and Texas in the winter.

Shorebirds, Gulls, and Terns

Counting sora rails in the expansive marshes is difficult. Our best estimate is 2,000. American bitterns pose much the same problems but we came up with 50 for the year.

Other species such as black-crowned night herons (20), double-crested cormorants (10), eared grebes (600), western grebes (100), willets (200), western sandpipers (500), Wilson's phalaropes (3,000), California gulls (250), Forester's terns (50), common terns (300), black terns (250), and long-billed dowitchers (150) being more conspicuous were easier to count.

The great blue heronery on the north shore of Upper Lake attracted 20 pairs. They raised approximately 60 young.

Some early visitors were 30 greater yellowlegs arriving on July 1, 15 lesser yellowlegs arriving on July 7, and 1 solitary sandpiper arriving on July 2.

Two possible additions to the refuge bird list are: (1) 1 upland plover observed west of Tom Creek on June 16 and 17; (2) 1 Franklin's Gull observed on Widgeon Pond on June 17.

B. Upland Game Birds

Blue, Grouse, and Ruffed Grouse

Infrequent encounters with ruffed grouse on the lower slopes of the Centennials give evidence of their presence while attesting to their low numbers (50). They aren't hunted on the refuge and seldom disturbed on surrounding lands and are very tame.

Higher up the slopes blue grouse are more common but not numberous (30).

Sage Grouse

Approximately 75 sage grouse were on the north side in the foothills of the Gravelys. Last year they numbered 60 and seldom get above 100.

Populations were high enough in the lower valley, off the refuge, to attract several parties of hunters. After the

hunting season groups of up to 50 birds were observed along the road in this area.

Gray Partidge

We knew of three coveys on the refuge. One covey was on the west end and two were along Elk Creek. The birds were observed along the roadsides in November when 5 inches of snow covered the uplands.

C. Big Game

Elk

The fall population of Rocky Mountain elk has been variously estimated at from 12 to 70 animals since 1964. The 1969 population was estimated to be 100. Frequent sightings during the fall indicated that this is a conservative estimate.

During the latter part of October, 45 elk were observed three miles south of the refuge. Later in November six inches of snow moved these animals to lower elevations where they remained off and on the refuge until the middle of December. Throughout November groups of up to 6 animals were evident by tracks or seen moving eastward on their annual fall migration across refuge lands. Seven head were regularly seen adjacent to the south boundary of the refuge and on December 2 ten elk were observed above the group of seven. Numerous tracks along the western boundary of the refuge show a substantial movement through the area to the west.

Apparently, although a limited number of elk may use the refuge for an extended period during the fall, most of the animals are found on the area for only a short period. They use the refuge sparingly during the breeding season and prior to migration. Movement over refuge lands may be leisurely - taking up to a week - or it may be hurried and only a matter of a few hours, or minutes, depending on the weather.

Paradoxically, the number of elk taken on the refuge during the hunting season is relatively low (3 in 1968; 1 in 1969) but this is probably more a reflection of low hunting pressure and the transitory nature of the elk that cross refuge lands than an indication of actual numbers.

Mule Deer

Mule deer were often seen during the summer along the timbered edges on the south side of the refuge. An aerial flight in August revealed 21 deer on the uplands and along the edge of the marsh.

In late summer and fall most of the deer moved high into the mountains and stayed until fall snows drove them down. During November, after the rut, they bunched up, sometimes in groups of up to 40, and migrated to the Gravelys on the north side of the refuge. As many as 25 head were seen wintering on the wind-blown slopes north of Culver Pond.

Moose

The moose population through the summer and fall was similar to populations of recent years. Twenty-six moose were counted on August 8; 15 bulls, 5, cows, and 6 calves. One of the cows had twins.

Most of the bulls moved out of the valley and into the mountains sometime in late summer or early fall. A few came back down in December but the snow was not deep and most stayed on the forested slopes. The cows stayed in the valley with their calves.

Three moose banded with red collars were seen on June 17 and one banded bull was seen on June 25. Moose banded in Idaho have been regular refuge visitors since 1966.

Pronghorn Antelope

The antelope count this year, made on August 8, was the lowest in years; 27 buck, 48 does, 64 kids. There has been a steady decline in the population since the highs of the early 60's of around 650 animals.

The Montana Fish and Game Department issued 2,000 antelope permits for this area in 1964 and 2,500 in 1965. This year they issued only 500. At the end of the hunting season a band of 150 antelope were on the west end of the refuge and several bands were seen off the refuge. If the winter is mild perhaps their numbers will begin to come back to their former levels.

Black Bear

Two bears were seen on the refuge during the summer. One troublesome bear chased two refuge campers into their pickup where they helplessly watched, as it tore their tent and bedrolls apart. Inasmuch as this was the bears only indiscretion this summer, no action was taken.

D. Fur Animals, Predators, and Rodents

Muskrats

Muskrats fared well this year. New houses began to take

shape in spring and major construction went on throughout the summer. By fall they were set for the coming winter. This year's population was little different from last years (2,000).

Beaver

Beaver were hard at it also. They constructed dams and lodges on Grayling, Elk, Humphrey, Shambow, O'dell, and Red Rock Creeks.

The results of the refuge moose study showed that there was more competition for moose browse from beaver than cattle. But with the moose and beaver populations at around 30 each there seems to be enough willows to go around.

Red Fox

Four fox dens were discovered on the refuge. One pair, west of Upper Lake at the mouth of Grayling Creek, raised two pups. A pair of sandhill cranes were also seen in this area and probably nested close by, but no chicks were seen.

A pair, not far from headquarters and close to the county road, raised 7 pups. Often on warm days they came out to sun themselves and provided refuge visitors with some interesting observations and pictures.

The others located their dens well out from human activity and were seen only from the air.

Coyotes

Coyotes increased in the valley and sightings were more frequent. Poisons and traps will take their toll this winter, but a few may survive to next summer.

E. Hawks, Eagles, and Magpies

Red-tailed and Swainson's hawks were the most common summer residents followed by sparrow, sharp-shinned, and Cooper's hawks. Marsh hawks were uncommon until they came through on their fall migration in October.

A pair of perigrine falcons frequented the cliffs of Baldy Mountain and another pair hunted in the canyons and above the flats of Tom Creek. Next summer, we hope to spend some time among the crags of the divide in search of their eyries.

An osprey nest was discovered above Hidden Lake next to the small pond called Goose Lake. The following observations were made on July 24:

" The nest, 3 feet across and 2½ feet thick, was about 100 feet above the ground atop a half-dead fir tree. It was made of coarse sticks but lined with a finer material.

An osprey stood on the edge of the nest, wings outstreatched, shading the lone nestling which by the end of July was already half grown. Its mate sat some distance away on a limb halfway up an old snag.

The adult bird began tearing off small chunks of fish (possibly a brook trout) about 10 inches long and feeding it to its young. The young bird fed almost 45 minutes taking bits of fish as fast as they could be offered. Following a short rest another fish about the same size was brought to the nest. The parent bird began feeding its young again when suddenly the still air was shattered by the shrill screams of its mate as it wheeled above the tops of the fir trees. The reason for its concern was soon apparent as two fishermen appeared and passed within 50 feet of the nesting tree. The pair followed the intruders and voiced their displeasure until the fishermen were well down the trail. The nestling seemed only concerned with satisfying its voaracious appetite."

Eagles

Fifteen bald eagles were observed on the refuge this spring and 4 were seen in the fall. On an aerial flight of December 16 we counted 15 bald eagles in the Island Park area (35 miles east of the refuge).

During the fall 10 golden eagles were observed.

Magpies

With the exception of a few crows and some Clark's nutcrackers to compete with, magpies pretty well had the place to themselves last winter. A dozen hung around headquarters scrounging what ever food they could find, which in a magpies diet might be anything that doesn't bite back.

F. Other Birds

Starlings nest in the valley but they are not common except during their fall migration. Most of the competition for nesting cavities is between mountain bluebirds and tree swallows, with tree swallows often winning out.

Several species not often seen in the valley were found to

be relatively common in some areas. Brewer's sparrows were often seen in the sage brush foothills on the north side of the refuge. In the conifers on the south side western tanagers, ruby-crowned kinglets, red-breasted nuthatches, Clark's nutcrackers, Hammond's flycatchers, and Townsend's solitaires were relatively common. Hermit thrushes, not on the bird list, were heard in the high conifers.

G. Fish

Culver and Widgeon Ponds yielded some catches of 3 and 4 pound brook trout. MacDonald Pond, unlike most years, produced few rainbows. The big ones were there and they could be seen rising in the evening though few people seemed able to catch them. The largest rainbow, that we know of, taken this year from MacDonald Pond weighed about 7 pounds.

Rip-rap along Red Rock Creek diverted the channel in some places and speeded the flow of water, enough, to wash clean several silt-covered gravel beds. This should be beneficial to spawning grayling whose numbers have been low for the past several years.

H. Reptiles

Members of this group were represented by a few garter snakes seen crossing the road on some of the warmer summer days.

I. Disease

No disease was noted this year.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. New Construction

Water Measuring

Standard contracted weirs were set in Humphrey, Duff, Collins and Hackett Creeks. Excavations were completed for a measuring device on Lone Willow Creek. Four small impoundments were created when these measuring devices were put in.

Impoundments

A new pond was developed in 1-G on Duff Creek to provide extra watering facilities and a small pond for waterfowl use.

Signs

Informational signs were put up at Culver, Widgeon, and MacDonald Ponds.

2. Rehabilitation

Irrigation Systems

Diversion controls were built on Collins, Duff, Hackett, and Grayling Creeks.

Ditching was completed on the west and south sides of 3-H to divert irrigation and seep waters.

Ten 24 inch turnout gates were set in Hanson's, Harlequin, and Shambow Irrigation Systems. One 30 inch slide gate was set in the Shambow Irrigation System. Six 24 inch turnout gates were installed in Collin's and Duff Creek Irrigation Systems.

About 1.5 miles of spreader ditches were developed to distribute water from Duff Creek.

Approximately 400 yards of road were built up and extended from Shambow Pond to Grayling Creek and a combination crossing measuring device was put across Grayling Creek. About 900 cubic yards of material were hauled.

Structures

The structure at the lower end of Lower Lake was completely rebuilt and the face of it was heavily riprapped. Approximately 1,500 cubic yards of material were hauled.

Bank Stabilization

Approximately 2,600 cubic yards of slide rock were used to riprap portions of Red Rock Creek that were cutting badly during high water. All portions of Red Rock Creek on the refuge that have been eroding have now been riprapped with the exception of those areas that are inaccessible.

Fences

Early in the season 16 man-weeks were expended on repairing fence damage caused by the deep snows and fence-cutting snowmobilers. No new fencing was undertaken.

Equipment

We were without a mechanic during the work period and experienced no little difficulty in keeping all of our equipment in operation. At one time we had four units sitting in front of the shop waiting for repairs.

The Kristi KT6 snow machine sat laid up for about a year and a half after 130 hours of operation. This summer it was reworked by the Kristi people and was supposedly ready for operation. However, we had to spend several days getting it ready for use. Only the bravest take it far from the shop, and not without a good pair of snowshoes and a mechanic.

Two new Alpine model twin track Ski-doos were purchased this fall. They have been receiving exclusive use and have been giving excellent service.

Buildings

Rewiring of the office and Quarters 90 was completed.

Radio System

Two additional handi-talkies and one hand set for use in one of the residences were added to the radio system. The radio system has been working out quite well and has added the extra margin of safety that we need in the winter.

Surplus

The following units have been put on surplus: 1963 Ford Station Wagon, 1963 Jeep ½ ton pickup, 1942 Universal Jeep.

Visitors

Other than a few tire repairs, refuge visitors and tourists required little assistance.

B. Plantings

1. Aquatic and Marsh Plants

Approximately 100 bullrush (Scirpus acutus) rootstocks and 50 sedge (Carex rostrata) rhizomes were planted in August on the east shoreline of Sparrow Pond.

2. Trees and Shrubs

None.

3. Upland Herbacious Plants

None

4. Upland Crops

None.

C. Collections

1. Seeds and Propagules

None.

2. Specimens

Nine trumpeter swan cygnets were sent to the Denver Wildlife Research Center for Pesticide analysis. These were some of the cygnets that were found dead in the marsh after the cold spell in June and July.

D. Control of Vegetation

None.

E. Planned Burning

None.

F. Fires

None.

IV RESOURCE MANAGEMENT

A. Grazing

Cattle, totalling 5,002 head, used 12,822 AUM's on 25,520 acres for a cash revenue of $25,644. Five horses used 15 AUM's on 115 acres.

Grazing on the refuge has been steadily cut over the past several years to bring all units within their recommended carrying capacities. On all but two units this has been accomplished.

Year	AUM's
1965	15,930.75
1966	14,407.90
1967	13,510.38
1968	13,395.90
1969	12,822.04

As permittees reduce their herds or give up their permits we have gained extra AUM's. We have used these AUM's to reduce the pressure on the ranges without disrupting the remaining permittees' operations.

On October 13, Mitch Boken, Range Consultant for the Soil Conservation Service, made an inspection trip of refuge range lands. These are his comments:

> "Throughout the entire inspection there was not a field visited that range condition or vigor had not improved - nor was there a field that had been over utilized or abused.
>
> It becomes quite evident the management has been very cognizant to good land management and is using livestock and range management practices to improve range condition and bring about a better habitat for wildlife management."

B. Haying

Two haying permits were issued this year. A total of 224.5 tons of wildlhay was harvested on 460 acres for a cash revenue of $1,571.50. Aftermath grazing on these two units was reduced by 2.5 AUM's for every ton of hay harvested.

C. Fur Harvest

The following were removed during the 1968-69 trapping season: 8 beaver, 34 muskrats, 55 red fox, 6 long-tailed weasels, 41 mink, 10 badger, 195 striped skunk, and 10 bobcat.

Beaver are controlled only where they become a nuisance. Bobcat are trapped whenever they become a problem at the winter swan feeding sites.

D. Timber Removal

None.

E. Commercial Fishing

None.

F. Other Uses

This was the last year for the Idlewild, Butana, and Daniel's Hunt Clubs. They have until June 30, 1970 to remove their personal belongings. The buildings will be disposed of by the government.

V FIELD INVESTIGATION AND APPLIED RESEARCH

A. Trumpeter Swan Nesting Study

Forty-seven swans nested on the refuge. There were 60 nests last year and 53 the year before.

Three new territories were established. Sixteen of last year's territories were abandoned this year. Forty-three pairs nested on the same nest sites as last year or close by.

Three nest sites were located on man-made impoundments. The nest on Shoveler Pond was built on an artificial nesting island.

Unit	Nests	Unit	Nests
Lower Lake	8 (11)*	Swan Lake	8 (11)
Rivermarsh	16 (25)	Ponds	7 (2)
Upper Lake	8 (9)		

*Number of nests on units in 1968.

Fourteen nests were found off the refuge. Elk and Conklin Lakes once again had a nest apiece. The rest of the nests were located on Red Rock River downstream from the refuge. Last year 15 nests were located off the refuge.

A pair was noted on the lower end of Elk Lake but they did not nest. They were also noted here in 1968 and did not nest. The habitat is marginal and the county road runs close by.

The cygnets on Conklin Lake were only a few days from hatching but the pair abandoned the nest when the rangerider moved into the cabin which is located 200 yds. from the nest site. This same thing happened in 1968.

B. Hatching Success Study

Twenty-two nests were checked to determine hatching success. There was a total of 95 eggs in these nests of which 47 hatched, for a hatching success of 49.5%. Applying this sample to the total number of nests gives a projected production of 100 cygnets.

C. Trumpeter Swan Mortality

Cygnet mortality was sudden. During the cold days of June and July 13 cygnets were found dead (13% of the total pro-

jected hatch).

Four cygnets were from one brood. Three were found on the nest, huddled together, and 1 was 20 feet away floating on the edge of a small opening in the marsh. Two cygnets were found floating in an opening in the marsh not far from an active nest and were probably from the same brood. Although five eggs hatched in this nest no other cygnets were found. No doubt many more cygnets went undiscovered because of the dense emmergent vegetation.

The weather for this period was:

Date	Precepitation	Max.	Min.
June			
24	.26	55	41
25	.56	47	35
26	.17	47	33
27	.04	51	28
28	.08	50	29
29	.08	49	27
30	.02	60	27
July			
1	T	69	32
2	T	76	32
3	T	76	32
4		64	31
TOTAL	1.21		
AVERAGES		58.5	31.5

Cygnet brood counts throughout the summer revealed a maximum of 7 cygnets on the refuge. Brood counts off the refuge showed a production of 11 cygnets. Observations this fall show a total production, to flight stage, of 20 cygnets for the entire valley.

D. Trumpeter Swan Neck Banding Study

Very few collar neck-banded swans were seen this year. The most observed were 5 males (red bands) and 2 females (green bands) on January 23 in the Island Park area. One of the females was part of a pair which had 1 cygnet.

One banded male and 3 banded females were observed in a group of 330 swans on the refuge on March 11. On areas off the refuge, 174 swans were counted on this same day but no collar neck-bands were seen. One banded male and 3 banded females were seen on Upper Lake on May 21. During the moult in July only one swan (male) out of 75 on the Lima Reservoir was banded. During the summer 1 banded male and 2 banded females remained on Upper Lake. One red band was found at the winter feeding site in Culver Pond.

Several problems came up during the neck banding study (high band loss; same color bands used in Alaska on trumpeter swans and Utah on whistling swans; poor materials and color lasting qualities of the bands). Although some objectives of the study were accomplished others were not. Data gathered over the past 4 years will be compiled shortly and the final report will be submitted.

E. Trumpeter Swan Banding

Fifty nonbreeding trumpeter swans were leg-banded this year. Most of the birds were caught on Lima Reservoir when they were in the moult. We started at the upper end of the reservoir in an air-thrust boat and caught the birds as we moved down the lake and came to them. They are not difficult to catch on the water. They don't dive too deep or for too long and often don't dive at all.

We handled 53 birds, banded 47, and 6 were already banded. After our efforts of that day we estimated that about 75% of the 75 birds on the reservoir were banded. Thirteen nonbreeders were caught on Upper Lake of which 10 were already banded.

Of the 16 birds that were already leg-banded, 5 had been originally collar banded also. Three had lost their collar bands and 2 still retained them.

F. Band Returns

A mallard banded on the refuge in 1965 was shot in California on January 2, 1969. A mallard banded on the refuge in 1965 was caught on the refuge in a steel trap in February of 1969.

G. Moose Management Study

The resultsof Robert Dorn's refuge moose management study show:

> " Food habits primarily determined the use of vegetation types. Browse accounted for 98.3% of all forage used by moose in summer; 4 species of willow made up 86.2% of the total browse used. In winter browse accounted for 99.8% of the forage used by moose;4species of willow made up 75.10% of the total browse used.
>
> Forage competition between moose and cattle was not significant under the conditions prevailing during this study,

Cattle preferred a species of willow little taken by moose. Most of the browse used by cattle was less than 5 feet above the ground level. Most of this was covered with snow in winter so was unavailable to moose. Forage competition caused by trampling and rubbing could become significant with heavier stocking. Stocking rates during the study were about one animal to 5 acres."

Mr. Dorn's management recommendations are:

"Stocking rates of cattle should take into account the availability of palatable forbs, grasses, and grass-like plants and of Salix wolfii which acts as a buffer between moose and cattle. The possibility of trampling damage should also be considered. Fences should be constructed to minimize hazards to moose. Beaver should be harvested regularly to minimize competition with moose.

The hunting season should start about September 20 because of the heard composition and size of the population at that time. Cows followed by calves should be protected and the annual quota should be raised from five to eight."

H. Aquatic Plant Survey

In 1966 an aquatic plant survey employing methods and proceedures according to Clark Websters Habitat Inventory Technique was initiated. Eighteen different species of aquatic plants have been recorded during the inventory. Production has varied from 7.5 tons per acre in Upper Lake to 62 tons per acre in Culver Pond.

This year, Lower Lake, Rivermarsh, MacDonald Pond, and Swan Lake were surveyed.

Results of the Lower Lake survey show a production of 16 tons of vegetation per acre. Lower Lake was surveyed in 1967 and showed a production of 15.5 tons per acre.

Although both surveys agree closely in total production they very markedly in species composition. Coontail (Ceratophyllum demersum) made up 17% of the vegetation in 1969 but was not recorded in 1967. Waterweed (Elodea canadensis), preferred swan food, increased from 44.1% of the total vegetation sampled in 1967 to 53.8% in 1969; this is a projected increase of 2,749 tons for all of Lower Lake.

Some other comparisons are:

Species	Percent of Vegetation Sampled	
	1967	1969
Potamogeton pectinatus	2.9	0.9
Potamogeton Richardsonii	14.6	15.0
Potamogeton zosteriformis	16.6	4.5
Potamogeton praelongus	6.2	3.4
Myriophyllum exalbescens	4.4	1.3
Lemna trisulca	4.7	0.7

Whether these differences are do to actual changes that have occurred or to a weakness inherent in the inventory procedure is not known. We will want to accumulate several years' data, though before we make any conclusions regarding the plant community.

Analysis of this year's data showed that 62 samples were required for a mean variation of each sample within 25% of the 95% confidence level. The 1967 data required only 31 samples to fall within 25% of the 95% confidence level. This points to the wide variation of plant density within the small-sized sample plots. Visually, one can also see a good deal of interspersion within the sample plots among the various species.

VI PUBLIC RELATIONS

A. Recreational Use

January, to April were for snowmobilers. They had good snow and good weather. About 150 traveled the snowmobile trail passing through the refuge.

May, the roads opened. Visitors, mostly wildlife observers, increased to 367 for the month.

The fishing season opened June 16, attracting 280 fishermen to the refuge ponds. Wildlife observers increased in June to 1,000 and picnickers and campers first appeared.

Visitors increased to 1,856 in July and 3,175 in August. September saw 690; October, 350; November, 100; December, 7 refuge visitors.

The following table summarizes visitor use for the last two years:

Activity	Visits-1968	Visits-1969
Hunting	230	355
Fishing	916	1,010
Wildlife Observation	447	5,581
Other	837	1,089
TOTALS	2,430	8,035

B. Refuge Visitors

Some of the visitors to the refuge this year were:

Date	Name	Organization	Purpose
4/23	Dave Cain	Weather Bureau	Official
5/6	O.B. Bacus	Beaverhead N.F.	Official
5/6	Johnny Greenwald	Beaverhead N.F.	Official
5/20	Dean C. Rodman	Benton Lake N.W.R.	Official
5/21	Louie Day Jr.	S.C.S.	Official
5/21	Bill Maguire	Simplot Co.	
6/16	Dave Paullin	Camas N.W. Refuge	Visiting
6/20	Cruickshank, Mr. & Mrs.	Photographer	Photography
6/26	Sam Short	B.L.M.	Official
7/2	Norman E. Rees	U.S.D.A.	Official
7/18	Van Wormer, Mr. & Mrs.	Writer	Photography
7/23	Jacobs, Mr. & Mrs. Glenn	Sacromento N.W.R.	Visiting
7/28	Charles W. Gibbons	C.M.R.N.W.Refuge	Official
7/31	Bob McVein	Regional Office	Official
8/1	Redfern, Mr. & Mrs. Don	National Elk Ref.	Visiting
8/7	Bill Downs	Weather Bureau	Official
8/7	Bob Salisbury	Weather Bureau	Official
8/12	Howard Gray	Photographer	Show Film
8/15	Wegge, Mr. & Mrs.	Norway State Game Re.	Visiting
8/22	Mekuria Tafesse	Exchange Student	Tour
8/22	Jishua Zuhe	Exchange Student	Tour
8/22	Kwaku K. Ksram, Africa	Exchange Student	Tour
8/22	Charley. Kabenjr	Exchange Student	Tour
8/22	George Kirutte	Exchange Student	Tour
8/27	Jim Langford	Regional Office	Official
9/8	Muncie, Mr. & Mrs. Milt	F.&G. Nebr.	Visiting
9/9	Anderson, Mr. & Mrs John	Nat'l Audubon Soc.	Birding
11/2	Peter Viking	KID-TV	Visiting
11/3	Wally Mueller	U.S.F.S.	Visiting
11/3	Val R. Gibbs	U.S.F.S.	Visiting

C. Refuge Participation

March 17-20th, Owen attended the annual State Fish & Game meeting in Helena, Montana.

March 17-21st, Heavy Equipment Mechanic, Ray Hotchkiss attended and completed the Heavy Equipment Maintenance & Service Training offered at the Kicking Horse Job Corps Camp, Ronan, Montana.

May 13, 90 Rotarians enjoyed a conservation talk about the Red Rock Lakes NW Refuge presented by Owen Vivion in Jackson, Wyoming.

May 23, Assistant Refuge Manager Ron Papike attended his first

Range Seminar, sponsored by the B.L.M. in Dillon, Montana.

June 14, Owen and Ron participated in the annual Red Rock Lakes Cattleman's Association meeting, held in Dell, Montana.

August 5, a rough draft of the proposed Continental Divide Trail in Montana was developed by representatives of the BSF&W, the USFS, and the USBLM during a meeting held in West Yellowstone. Mr. Vivion represented the BSF&W.

August 20, Owen and Ron made a trip to Hebgen Lake to survey Forest Service land for possible wildlife development.

August 22, Owen conducted a talk and tour of the refuge to a group of African exchange students.

September 13, Red Rock Lakes donated Ron Papike, and 112 man hours to the Tulare Basin botulism problem in California.

October 7, Owen participated in the National Trumpeter Swan Society meeting held in Minnesota.

November 13th, Ron presented Howard Gray's new film "Time and The Trumpeter Swan" to the Lima High School, Elementary and P.T.A. groups. This film was of special interest to these groups as "Time and The Trumpeter Swan" was filmed in their own backyard; Red Rock Lakes National Wildlife Refuge.

D. Hunting

Waterfowl

The opening weekend of the waterfowl hunting season brought 100 hunters to the refuge. Success was 2.1 ducks per hunter. On Sunday of the opening weekend, temperatures dropped and Lower Lake began freezing. Most hunters had difficulty getting out and left early.

Temperatures warmed and the lake opened two weeks later but few hunters were on hand to take advantage of the hunting.

Widgeon were most often taken followed by lesser scaup, gadwall, mallard and blue-winged teal. Crippling loss was about 16%.

Antelope

Only 500 antelope permits were issued by the Montana Fish and Game Department for the Centennial Valley; the opener coincided with the elk, deer, and moose opener; antelope numbers were low, consequently antelope hunters were down from past years.

Deer and Elk

One elk and 3 deer were taken on the refuge. The fall was mild with little snow during the hunting season to move the elk and deer out of the mountains and to the valley where most of the hunting pressure was concentrated.

Moose

Five permits were issued for the refuge moose hunting area. One bull, 2 cows, and 1 calf were taken by four of the permit holders. One permit holder didn't hunt.

E. Violations

A party of hunters tried illegally to take a moose on the refuge but were unsuccessful. We heard the shooting and gave chase but didn't catch up with them. These people, out of staters, were apprehended by state wardens a few days later with two illegal deer.

Another incident involved one of the moose permit holders. A party of 3 men and 2 women showed up to go moose hunting. One of the women, who was on crutches, had a moose permit and of course was the only one who could legally shoot a moose. It seems, though that her husband and his friends intended to do the shooting for her so that they could be on their way that same day. Our warnings and constant surveillance disrupted their plans, however, and they went home four days later empty-handed. They came back two weeks later and she got her moose. It was the calf.

F. SAFETY

SAFETY meetings are held monthly with regular staff personnel rotating responsibility . SAFETY material, literature, and movies and shown.

There were no lost time accidents this year. The station now has 1,229 lost time accident free work days, up to December 31.

VII OTHER ITEMS

A. Items of Interest

There was a complete turnover of refuge personnel, beginning with the exchange of postions between John Annear and Ron Papike. John went to Deer Flat Refuge in southwestern Idaho and Ron took over for John at Red Rock Lakes.

Ray and Katie Hotchkiss went next. After nine years in the valley they finally decided that they had enough of the winters and transferred to Ruby Lakes Refuge, Nevada. Ray is a skilled mechanic and we missed him immediately, however, Dan Sullivan filled in for Ray and has done a fine job keeping things running. Dan decided to stay on through the winter when it looked like we weren't going to get another mechanic. His snow sense and valley experience have been invaluable to us.

We also lost our clerk (Katie) when the Hotchkisses moved. Ron's wife, Becky reluctantly accepted the position. Although she would rather be fishing for brook trout on Grayling Creek than sitting in front of a typewriter. She has really been a help.

And to make a clean sweep, Gene Stroops, Benton Lake, exchanged positions with Owen Vivion and took over as manager in December.

Allan and Helen Cruickshank spent a month on the refuge filming wildlife and wildflowers. They are making a film for the Audubon Society on the natural history of Montana.

The premiere of Howard Gray's film "Time and the Trumpeter Swan" was held at Lakeview on August 12. This is an excellent, probably the best, film on the trumpeter swan and Red Rock Lakes Refuge. It documents the role of the refuge in saving the swans from extirpation and explains our present management to assure their continued well-being.

B. Acknowledgements

Gene Stroops ..... Editing
Ron Papike ..... Preparation
Becky Papike ..... Typing

SIGNATURE PAGE

Submitted by:

E. D. Stroops
(Signature)

E. D. Stroops

Refuge Manager
(Title)

Date: 2-2-70

Approved, Regional Office:

Date: 2/24/70

(Signature)

Asst. Regional Refuge Supervisor
(Title)

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(Rev. March 1953)

WATERFOWL

REFUGE Red Rock Lakes Refuge MONTHS OF January TO April, 19 69

(1) Species	(2) Weeks of reporting period: 12/29-1/4: 1	1/5-11: 2	1/12-18: 3	1/19-25: 4	1/26-2/1: 5	2/2-8: 6	2/9-15: 7	2/16-22: 8	2/23-3/1: 9	3/2-8: 10
Swans:										
Whistling										
Trumpeter	300	335	325	320	330	305	320	320	325	330
Geese: Total Swan	300	335	325	320	330	305	320	320	325	330
Canada	30	30	30	30						
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Total Geese	30	30	30	30						
Ducks:										
Mallard	400	600	800	800	700	800	900	1,000	1,000	1,000
Black										
Gadwall	10	10	10	10						
Baldpate	150	200	200	300	200	200	250	250	300	300
Pintail	10	10	10						5	5
Green-winged teal	5	5	5							
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup	50	20	5					10		
Goldeneye	1,000	800	600	700	600	600	600	700	800	900
Bufflehead	20	20	25	25	10	20	20	10	10	20
Ruddy										
Other										
Totals	1,645	1,665	1,655	1,835	1,510	1,620	1,770	1,970	2,115	2,225
Coot:										

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(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Red Rock Lakes MONTHS OF January thru April, 1969

(1) Species	(2) Weeks of reporting period: 3/9-15 (11)	3/16-22 (12)	3/22-29 (13)	3/30-4/5 (14)	4/6-12 (15)	4/13-19 (16)	4/20-26 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:	Aerial						Aerial				
Whistling											
Trumpeter	330	320	300	295	285	268	260		30,820		
Geese: Total Swan	330	320	300	295	285	268	260		30,820		
Canada		10	50	100	150	200	200		5,810		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other Total Geese		10	50	100	150	200	200		5,810		
Ducks:											
Mallard	1,000	1,200	1,300	1,400	1,700	2,200	2,750		136,850		
Black											
Gadwall		50	80	80	100	100	300		5,250		
Baldpate	300	400	450	450	500	600	700		40,250		
Pintail	10	25	50	50	200	600	1,000		13,825		
Green-winged teal					25	170	200		3,220		
Blue-winged teal					5	20	30		385		
Cinnamon teal					10	20	30		420		
Shoveler					50	100	100		1,750		
Wood											
Redhead				10	80	450	650		8,330		
Ring-necked		5	10	50	100	150	150		3,285		
Canvasback					25	100	220		2,815		
Scaup		5	10	50	100	400	500		6,650		
Goldeneye	900	900	800	950	1,000	800	800		94,150		
Bufflehead	50	50	100	100	100	200	250		7,910		
Ruddy							10		70		
Other Mergansers					5	20	30		385		
Totals	2,260	2,635	2,800	3,110	4,100	5,730	7,770		125,115		
Coot:			20	100	200	1,000	3,500		33,740		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	36,820	390	
Geese	5,810	200	
Ducks	325,115	7,770	
Coots	33,740	3,500	

SUMMARY

Principal feeding areas MacDonald Pond, Calver Pond

Principal nesting areas

Reported by John T. Anneer, Biologist

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

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1953

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WATERFOWL

REFUGE Red Rock Lakes MONTHS OF May TO August, 1969

(1) Species	(2) Weeks of reporting period: 4/27-5/3 (1)	5/4-10 (2)	5/11-17 (3)	5/18-24 (4)	5/25-31 (5)	6/1-7 (6)	6/8-14 (7)	6/15-21 (8)	6/22-28 (9)	6/29-7/5 (10)
Swans:										
Whistling										
Trumpeter	230	220	220	220	220	220	220	300	275	275
Total Swan	230	220	220	220	220	220	220	300	275	275
Geese:										
Canada	200	200	200	200	200	200	220	240	240	240
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Total Geese	200	200	200	200	200	200	220	240	240	240
Ducks:										
Mallard	2,000	2,000	500	400	400	400	500	600	640	650
Black										
Gadwall	300	300	300	300	300	300	350	400	450	450
Baldpate	700	500	350	200	200	200	250	275	275	275
Pintail	1,000	500	400	400	400	400	500	500	550	575
Green-winged teal	250	200	160	160	160	160	160	180	200	250
Blue-winged teal	30	100	100	150	150	150	200	200	200	250
Cinnamon teal	30	100	100	170	170	170	200	250	275	275
Shoveler	100	150	200	260	260	260	280	290	290	300
Wood										
Redhead	650	700	750	750	750	750	850	1,000	1,200	1,200
Ring-necked	150	200	300	300	300	300	350	400	450	500
Canvasback	220	200	160	160	160	160	200	225	275	300
Scaup	800	1,000	1,400	1,400	1,400	1,400	1,600	2,000	2,000	2,000
Goldeneye, Barrow's	800	500	100	50	50	50	50	60	60	80
Bufflehead	250	200	50	50	50	50	50	50	50	60
Ruddy	20	100	350	600	600	600	600	620	620	650
Other				10	10	10	10	10	10	20
Total Ducks	7,300	6,750	5,220	5,360	5,360	5,360	6,150	7,050	7,545	7,835
Coot:	3,500	3,500	3,000	3,500	3,500	3,500	3,500	4,000	4,500	5,000

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(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Red Rock Lakes MONTHS OF May TO August, 1969

(1) Species	(2) Weeks of reporting period: 7/6-12 11	7/13-19 12	7/20-26 13	7/27-8/2 14	8/3-9 15	8/10-16 16	8/17-23 17	8/24-30 18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter	250	250	250	250	250	250	250	250	30,800	15	15
Total Swan	250	250	250	250	250	250	250	250	30,800	15	15
Geese:											
Canada	250	250	200	200	150	100	150	200	25,480	11	48
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Total Geese	250	250	200	200	150	100	150	200	25,480	11	48
Ducks:											
Mallard	800	1,000	2,000	5,000	8,000	8,000	15,000	15,000	440,230	21	555
Black											
Gadwall	500	1,000	1,000	1,000	3,000	6,200	11,200	7,200	241,850	9	235
Baldpate	350	500	500	1,000	2,000	5,000	17,500	17,500	333,085	8	209
Pintail	1,000	1,200	1,500	1,500	4,500	12,000	12,000	8,500	331975	9	223
Green-winged teal	250	300	350	300	200	200	200	200	27,160	6	148
Blue-winged teal	250	500	500	1,000	1,000	1,500	1,500	1,500	64,960	4	98
Cinnamon teal									12,180	5	139
Shoveler	350	500	500	500	500	500	500	500	43,610	10	248
Wood											
Redhead	1,200	2,500	2,500	2,500	3,000	3,500	3,500	4,500	222,600	31	758
Ring-necked	500	500	500	500	500	500	500	500	50,750	14	400
Canvasback	300	350	350	400	400	450	450	450	36,470	5	130
Scaup	2,500	3,000	3,000	3,000	3,000	3,000	3,000	3,000	269,500	42	1,124
Goldeneye, Barrow's	100	100	100	100	100	100	100	100	18,200	2	10
Bufflehead	100	100	100	100	100	100	100	100	11,620	4	95
Ruddy	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	89,320	25	534
Other	20	20	10						910	2	50
Total Ducks	9,220	12,570	13,910	17,900	27,300	42,050	66,550	60,050	2,194,360	197	4,956
Coot:	7,000	8,500	8,500	8,500	8,500	8,500	8,500	8,500	728,000	307	5,526

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	30,800	300	15
Geese	25,480	250	48
Ducks	2,194,360	66,550	4,956
Coots	728,000	8,500	5,526

SUMMARY

Principal feeding areas Upper, Lower Lake and River Marsh

Principal nesting areas Over water in carex stands and adjacent uplands close to marsh edge.

Reported by Ronald V. Papike

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: - Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1750
Form [illegible]1
(Rev. March 1953)

WATERFOWL

REFUGE Red Rock Lakes MONTHS OF September TO December, 1969

(1) Species	(2) Weeks of reporting period: 8/31-9/6 (1)	9/7-13 (2)	9/14-20 (3)	9/21-27 (4)	9/28-10/4 (5)	10/5-11 (6)	10/12-18 (7)	10/19-25 (8)	10/26-11/1 (9)	11/2-8 (10)
Swans:										
Whistling								250	1,500	1,500
Trumpeter	175	175	175	150	150	150	40	100	50	150
Total Swan	175	175	175	150	150	150	40	350	1,550	1,650
Geese:										
Canada	150	150	150	150	150	100	100	400	400	500
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Total Geese	150	150	150	150	150	100	100	400	400	500
Ducks:										
Mallard	10,000	5,500	5,000	5,000	2,000	3,500	3,500	2,000	1,000	1,000
Black										
Gadwall	3,500	250	500	500	450	500	500	400		
Baldpate	20,000	20,000	30,000	40,000	40,000	20,000	4,000	4,000	3,000	3,000
Pintail	6,000	2,500	1,500	1,500	1,500	1,000	600	100		
Green-winged teal	500	500	500	500	500	500	250	200	250	250
Blue-winged teal	1,000	700	500	500	500	500				
Cinnamon teal										
Shoveler	500	300	600	600	600	500				
Wood										
Redhead	2,500	1,700	1,000	1,000	1,000	1,000	800	200	500	500
Ring-necked	700	700	250	250	250	300		100	100	100
Canvasback	600	600	500	500	300	150	150			
Scaup Lesser	1,000	200	2,000	2,000	3,500	1,500				
Goldeneye	50	10	50	50	50	50	100	250	250	250
Bufflehead	400	800	100	100	100		50	50	50	50
Ruddy	1,500	2,000	1,000	1,000						
Other Common Merg.			25	25	25					
Total Ducks	48,250	35,760	43,525	53,525	50,775	29,500	9,950	7,300	5,150	5,150
Coot:	19,500	25,000	30,000	30,000	30,000	25,000	1,000	250		

3 -1750a
Cont. R-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Red Rock Lakes MONTHS OF September TO December, 1969

(1) Species	(2) Weeks of reporting period: 11/9-15 (11)	11/16-22 (12)	11/23-29 (13)	11/30-12/6 (14)	12/7-13 (15)	12/14-20 (16)	12/21-27 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	500								26,250		
Trumpeter	200	200	175	150	150	150	150		17,430		
Total Swans	700	200	175	150	150	150	150		43,680		
Geese:											
Canada	350	400	250	100					23,450		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Total Geese	350	400	250	100					23,450		
Ducks:											
Mallard	2,000	2,000	2,000	1,000	1,000	500	250		330,750		
Black											
Gadwall									46,200		
Baldpate	3,000	3,000	3,000	3,000	1,500	500	500		1,389,500		
Pintail									102,900		
Green-winged teal	100	100	100	100	100	100	100		32,500		
Blue-winged teal									25,900		
Cinnamon teal											
Shoveler									21,700		
Wood											
Redhead	200	100	50	50					74,200		
Ring-necked	50	50	50	50	25	25	25		24,175		
Canvasback									19,000		
Scaup									74,400		
Goldeneye	800	800	500	500	500	350	300		38,000		
Bufflehead	50	50	50	25	25	25	25		13,650		
Ruddy									30,500		
Misc. Common Merg.									525		
Total Ducks	6,250	6,100	5,750	4,725	3,150	1,500	1,200		2,222,980		
Coot:									1,125,250		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	43,680	1,650	
Geese	23,450	500	
Ducks	2,222,920	53,525	
Coots	1,125,250	30,000	

SUMMARY

Principal feeding areas Upper, Lower Lake and River Marsh

Principal nesting areas Over water in carex stands adjacent uplands close to marsh edge.

Reported by Ronald V. Papike

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

File
3-1751
Form NR-1.
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Red Rock Lakes Months of January to April 1969

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared Grebe	30	4/23	200	4/30	Still Present					200
Western Grebe	10	4/23	15	4/30	"	"				15
White Pelican	10	4/29	50	4/30	"	"				50
Great Blue Heron	3	4/11	100	4/30	"	"				100
Sandhill Crane	2	3/30	150	4/30	"	"				150
II. Shorebirds, Gulls and Terns:										
Killdeer	3	4/4	300	4/30	Still Present					300
Common Snipe	3	4/10	50	4/30	"	"				50
Long Billed Curlew	2	4/25	30	4/30	"	"				30
Willet	4	4/25	10	4/30	"	"				10
Avocet	5	4/18	25	4/30	"	"				25
California Gull	2	4/10	40	4/30	"	"				40
Ring Billed Gull	3	4/10	20	4/30	"	"				20

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	1	4/19	25	4/30	Still Present			25
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	Present all Period		10	4/28	"	"		10
Duck hawk								
Horned owl	Resident							15
Magpie	Resident							200
Raven	OBSERVED OCCASIONALLY THROUGHOUT PERIOD							25
Crow	2	3/10	250	4/19	"	"		400
Sharp Shinned Hawk	1	3/19	5	4/3	"	"		5
Red Tailed Hawk	2	3/28	5	4/30	"	"		5
Swainson's Hawk	1	4/9	6	4/30	"	"		6
Rough Legged Hawk	2	4/14	2	4/30	"	"		4
Bald Eagle	Observed all period		15	4/20	"	"		18
Marsh Hawk	2	4/1	10	4/30	"	"		10
Sparrow Hawk	1	4/1	25	4/30	"	"		30

Reported by John T. Anneer, Biologist

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INTERIOR--PORTLAND, OREGON

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Red Rock Lakes Months of May to August 1969

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared Grebe	30	5-15	600	8-20	END OF PERIOD				100	600
Western Grebe	6	6-1	100	8-1	END OF PERIOD				20	100
Pied-billed Grebe	2	6-1	30	8-1	END OF PERIOD				20	50
White Pelican	100	5-10	400	5-3	END OF PERIOD					400
Double-crested Cormorant	1	7-15	10	7-15	END OF PERIOD					10
Great Blue Heron	1	5-8	100	8-15	END OF PERIOD		1	20	60	100
Black-crowned Night Heron	2	6-1	20	8-10	END OF PERIOD				10	20
American Bittern	3	5-15	50	8	END OF PERIOD					50
Sandhill Crane	10	5-9	300	8-30	END OF PERIOD				22	300
Sora Rail	6	6-1	2,000	8-30	END OF PERIOD					2,000
II. Shorebirds, Gulls and Terns:										
Killdeer	PREVIOUS PERIOD		500	8-1	END OF PERIOD					500
Common Snipe	PREVIOUS PERIOD		400	8-1	END OF PERIOD					450
Long-billed Curlew	PREVIOUS PERIOD		150	6-30	2	8-15				250
Spotted Sandpiper	10	5-10	200	6-30	4	8-15				200
Willet	2	5-10	200	7-15	END OF PERIOD					200
Greater Yellowlegs	3	7-1	30	7-15	END OF PERIOD					30
Long-billed Dowitcher	10	7-1	150	7-15	END OF PERIOD					150
Western Sandpiper	20	7-1	500	7-30	END OF PERIOD					500
Avocet	2	5-10	200	4-15	END OF PERIOD					200
Wilson's Phalarope	2	5-10	3,000	7-15	END OF PERIOD					3,000
California Gull	10	5-10	250	8-15	END OF PERIOD					250
Franklin's Gull	4	7-1	50	7-15	END OF PERIOD					50
Forester's Tern	2	5-10	150	7-15	END OF PERIOD					150
Common Tern	12	5-10	300	7-15	END OF PERIOD					350
[illegible]ck Tern	10	5-20	250	7-30	END OF PERIOD					250

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	2	5-15	40	8-20	END OF PERIOD			600
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	1	5-10	1	5-15	2	7-20		3
Duck hawk	1	6-10	6	8-10	1	8-30		6
Horned owl	1	5-30	1	6-10	1	6-10		20
Magpie	BEGINNING OF PERIOD		200	8-10	20	8-30		300
Raven								
Crow	BEGINNING OF PERIOD		100	8-20	END OF PERIOD			250
Goshawk	1	5-28	1	7-10		7-10		4
Sharp-shinned Hawk	1	5-28	1	6-7	1	8-27		4
Red-tailed Hawk	BEGINNING OF PERIOD		15	8-15	1	8-29		25
Swainson's Hawk	BEGINNING OF PERIOD		20	8-20	2	8-31		30
Marsh Hawk	BEGINNING OF PERIOD			8-12	2	8-31		25
Prairie Falcon	1	6-10	1	6-10	1	6-10		5
Sparrow Hawk	BEGINNING OF PERIOD		35	8-20	3	8-31		50
Short-eared Owl	BEGINNING OF PERIOD		25	8-20	1	8-31		30

Reported by Ronald V. Papike, Biologist

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

M17058

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Red Rock Lakes Months of September to December 1969

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:			Peaked During							
Eared Grebe	Previous Period		Last Period		3	10/5				200
Western Grebe	"	"	"	"	2	9/10				75
Pied-Billed Grebe	"	"	"	"	1	9/30				50
White Pelican	"	"	"	"	50	9/22				100
Double-Crested Cormorant	"	"	"	"	2	9/10				10
Great Blue Heron	"	"	"	"	1	10/8				35
Black-Crowned Night Heron	"	"	"	"	1	10/21				15
American Bittern	"	"	"	"	2	9/13				20
Sandhill Crane	"	"	"	"	10	9/28				250
Sora Rail	"	"	"	"	4	9/7				1,000
II. Shorebirds, Gulls and Terns:			Peaked During							
Killdeer	Previous Period		Last Period		2	11/2				300
Common Snipe	"	"	"	"	1	12/8				400
Willet	"	"	"	"	3	9/5				100
Greater Yellowlegs	"	"	"	"	20	9/5				20
Long-Billed Dowitcher	"	"	"	"	50	9/5				50
Western Sandpiper	"	"	"	"	200	9/30				400
Avocet	"	"	"	"	15	9/8				100
Wilson's Phalarope	"	"	"	"	250	9/30				1,000
California Gull	"	"	"	"	50	11/2				150
Franklin's Gull	"	"	"	"	10	9/10				25
Forester's Tern	"	"	"	"	5	9/12				100
Common Tern	"	"	"	"	2	9/5				100
Black Tern	"	"	"	"	1	9/21				100

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:									
Mourning dove	Previous	Period	Last Period		2	11/10			50
White-winged dove									
IV. Predaceous Birds: Bald	1	10/1	1	12/20	1	12/20			4
Golden eagle	Previous	Period	5	11/10	1	12/30			10
Duck hawk	Previous	Period	1	9/30	1	9/30			2
Horned owl	Previous	Period	10	10/5	1	11/20			10
Magpie	Previous	Period	Last Period		3	12/31			150
Raven									
Crow	Previous	Period	Last Period		2	12/25			100
Goshawk	Previous	Period	2	9/10	1	10/1			3
Sharp-Shinned Hawk	Previous	Period	1	9/2	1	10/3			2
Red-Tailed Hawk	Previous	Period	Last Period		1	11/5			12
Marsh Hawk	Previous	Period	25	10/1	1	12/28			35
Sparrow Hawk	Previous	Period	3	9/10	1	10/2			8

Reported by Ronald V. Papike

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INTERIOR--PORTLAND, OREGON

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Red Rock Lakes For 12-month period ending August 31, 1969

Reported by Ronald V. Papike Title Biologist

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
UNIT I Impoundments & Creeks	Crops		Ducks	1,379,868	404	380
	Upland		Geese	504	10	25
	Marsh		Swans	39,578	8	5
	Water	350	Coots	131,205	122	200
	Total	350	Total	1,551,155	544	610
UNIT II Upper Lake	Crops		Ducks	2,069,802	1,489	1,648
	Upland		Geese	33,304		
	Marsh	20	Swans	43,236	16	
	Water	2,880	Coots	506,076	84	108
	Total	2,900	Total	2,662,418	1,588	1,756
UNIT III Swan Lake	Crops		Ducks	344,967	562	645
	Upland		Geese	504	6	5
	Marsh	100	Swans	7,422	16	
	Water	300	Coots	112,461	494	558
	Total	400	Total	465,354	1,078	1,208
UNIT IV River-Marsh	Crops		Ducks	689,934	954	1,328
	Upland		Geese	504	6	8
	Marsh	6,000	Swans	11,132	42	4
	Water	2,000	Coots	447,971	1,682	2,970
	Total	8,000	Total	1,149,541	2,684	4,310
UNIT V Lower Lake	Crops		Ducks	2,345,775	778	894
	Upland		Geese	3,024	12	10
	Marsh	340	Swans	16,078	12	3
	Water	1,200	Coots	674,768	980	1,656
	Total	1,540	Total	3,039,645	1,782	2,563
UNIT VI Upland	Crops		Ducks	68,994	96	61
	Upland	26,566	Geese	7,560		
	Marsh	150	Swans	1,237	2	3
	Water	50	Coots	1,874	26	34
	Total	26,766	Total	79,665	124	98
UNIT TOTALS	Crops		Ducks	6,899,340	4,282	4,956
	Upland	26,556	Geese	50,400	34	48
	Marsh	6,610	Swans	123,683	96	15
	Water	6,780	Coots	1,874,355	3,388	5,526
	Total	39,946	Total	8,947,778	7,800	10,545

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

(5) **Production:** Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1750c
Form NP[illegible]C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Red Rock Lakes

Year 1969

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/4-10	76	175	Widgeon 46, Scaup 32, Gadwall 22, Mallard 11, BW Teal 11, Shoveler 9, Canvasback 7, GW Teal 7, Redhead 4, Goldeneye 3, Ruddy 2, Ring-necked 1, Bufflehead 1, C. Teal 1, Pintail 3.	163	30	193	105	267
10/11-17	5	56	Widgeon 4, Scaup 4, Mallard 2, Goldeneye 1, Ruddy , 1, Merganser 1.	13	3	16	20	64
10/18-24	2	6	Widgeon 2, Goldeneye 1, Shoveler1.	4	1	5	5	13
11/8-14	3	3	Mallard 5, Widgeon 3, GW Teal 2, Scaup 2, Goldeneye 1.	13	2	15	3	15
TOTALS	86	240	Widgeon 55, Scaup 38, Gadwall 22, Mallard 18, BW Teal 11, Shoveler 10, GW Teal 9, Canvasback 7, Goldeneye 6, Redhead 4, Ruddy 3, Pintail 3, C. Teal 1, Bufflehead 1, Ring-necked 1, Merganser 1, Unidentified 3.	193	36	229	133	359

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

NR Club 3-1752
Form [illegible]-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Red Rock Lakes Months of January to April, 194__

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Blue Grouse	Conifers 3,000 acres								15	Severe winter with heavy snows caused a noticable reduction in the populations
Ruffed Grouse	Aspen-fir-willow 3,000 acres								35	
Sage Grouse	Sagebrush-grass 3,000 acres								20	No observations this period
Gray Partridge	Sagebrush-meadow 24,000 acres								40	Covey's winter near Mac's Pond and Elk Springs, also north of Culver Pond.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES:	Use correct common name.
(2) DENSITY:	Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
(3) YOUNG PRODUCED:	Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
(4) SEX RATIO:	This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
(5) REMOVALS:	Indicate total number in each category removed during the report period.
(6) TOTAL:	Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
(7) REMARKS:	Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form MB-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Red Rock Lakes Months of May to August, 1946

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Blue Grouse	Conifers, 3,000ac.								35	
Ruffed Grouse	Aspen-Fir-Willow 3,000 acres								75	
Sage Grouse	Sagebrush grass 3,000 acres								75	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES:	Use correct common name.
(2) DENSITY:	Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
(3) YOUNG PRODUCED:	Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
(4) SEX RATIO:	This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
(5) REMOVALS:	Indicate total number in each category removed during the report period.
(6) TOTAL:	Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
(7) REMARKS:	Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form [illegible]-2
(April 1946)

UPLAND GA[illegible] BIRDS

1613

Refuge **Red Rock Lakes** Months of **September** to **December**, 19 **69**

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Blue Grouse	**Conifers 3000 acres**								**30**	
Ruffed Grouse	**Aspen-Fir-Willows 3000 acres**								**50**	
Sage Grouse	**Sage Brush, Grass 3000 acres**								**75**	
Gray Partridge	**Sage Brush, Meadows 24,000 acres**								**35**	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1)	SPECIES:	Use correct common name.
(2)	DENSITY:	Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
(3)	YOUNG PRODUCED:	Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
(4)	SEX RATIO:	This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
(5)	REMOVALS:	Indicate total number in each category removed during the report period.
(6)	TOTAL:	Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
(7)	REMARKS:	Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-17
Form NR-3
(June 1945)

BIG GAME

Refuge Red Rock Lakes Calendar Year 1969

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Black Bear												3	1	
Elk			1									100		M:F
Mule Deer			3									150	50	40:60
Moose		6	4									45	20	M29 F54 Y64
Antelope		64	2									147		

Remarks:

Reported by Ronald V. Papike

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-17
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Red Rock Lakes Year ending April 30, 1969

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula-tion
Beaver	Willow, aspen, streams 2,400 acres	160		8				T-6711	100%					15
Muskrat	Marsh-water 10,000 acres	5		34				"	"					2,000
Porcupine	Upland, forest 5,000 acres	66						"	"					75
Coyote	Marshmeadow, upland 26,000 acres	5,200						"	"					5
Red Fox	Marsh, meadow, upland 26,000 acres	2,600		55				"	"					10
Longtailed Weasel	Meadow, uplands, forest 19,000 acres	127		6				"	"					150
Mink	Lakes, streams, marsh 15,000 acres	43		41				"	"					350
Badger	Meadow, upland, forest 19,000 acres	64		10				"	"					30
Striped Skunk	Marsh, meadow, upland 26,000 acres	130		195				"	"					200
Bobcat	Upland, forest 25,000 acres	2,500		10				"	"					10

* List removals by Predator Animal Hunter

REMARKS:

Reported by John T. Ansear, Biologist

INSTRUCTIONS

Form NR-4 - **SMALL MAMMALS** (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) **SPECIES:** Use correct common name. **Example:** Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) **DENSITY:** Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) **REMOVALS:** Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) **DISPOSITION OF FUR:** On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) **TOTAL POPULATION:** Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

INTERIOR--PORTLAND, OREGON

3-1757
Form NR-7
(Rev. June 1960)

NONAGRICULTURAL COLLECT[illegible]S, RECEIPTS, AND PLANTINGS (1)

Refuge Red Rock Lakes Year 19 69

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
							Sparrow Pond, east shoreline		150 yards	100 Scirpus acutus, rootstocks, 50 Carex rostrata, rhizomes	8/21	Unknown	

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic 150 yards shoreline
Hedgerows, cover patches
Food strips, food patches
Forest plantings

Remarks: Results to be evaluated during the 1970 summer.

76148

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Red Rock Lakes County Beaverhead State Montana

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
NONE								NONE	
								Fallow Ag. Land NONE	

No. of Permittees: Agricultural Operations NONE Haying Operations 2 Grazing Operations 19

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	5,002	12,822.04	25,644.08	25,520
				2. Other	5	15	30.00	115
				1. Total Refuge Acreage Under Cultivation				NONE
Hay - Wild	224.5	460	1,571.50	2. Acreage Cultivated as Service Operation				NONE

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.DUP.,D.C.61-88950

3-1570
NR-Sa
(4/54)

REFUGE GRAIN REPORT

Refuge Red Rock Lakes Months of January through December, 1969

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Wheat	2,000	1,500bu.	3,500			1,000	1,000	2,500		2,500	

(8) Indicate shipping or collection points Camas National Wildlife Refuge.

(9) Grain is stored at Culver and MacDonald Pond.

(10) Remarks supplemental winter swan feed.

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1755
Form NR-5
607

DISEASE

Refuge Red Rock Lakes Year 1969

Botulism

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

NO DISEASE NOTED THIS YEAR.

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

3-1761
Form NR-[illegible]

TIMBER REMOVAL

Refuge Red Rock Lakes Year 19[illegible]69

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
		NO TIMBER REMOVED THIS YEAR.						

Total acreage cut over..... Total income.....

No. of units removed B. F..... Method of slash disposal.....
Cords.....
Ties.....
.....

Interior—Duplicating Section, Washington, D. C. 24316

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Red Rock Lakes

Proposal Number:

Reporting Year: 1969

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		NO PESTICIDES WERE APPLIED THIS YEAR.						

10. Summary of results (continue on reverse side, if necessary)

INTERIOR--PORTLAND, OREGON

"Now what are they up to?" McLaury

They had less than a 30% chance of surviving to flight stage.

McLaury

Trumpeter swans on Culver Pond share their winter feeding site with common goldeneyes.

Black-crowned Night Heron McLaury

Shiras moose above Upper Red Rock Lake. McLaury

Shiras moose in Upper Red Rock Lake. McLaury

Shootingstars by Annear

Nesting island on MacDonald Pond. McLaury

Sheep Mountain Natural Area. Marshall

Headquarters Annear

Private Land

Refuge Land

Annear

Picnick Grounds by McLaury

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Red Rock Lakes MONTHS OF September TO December, 1969

(1) Species	(2) Weeks of reporting period: 8/31-9/6 (1)	9/7-13 (2)	9/14-20 (3)	9/21-27 (4)	9/28-10/4 (5)	10/5-11 (6)	10/12-18 (7)	10/19-25 (8)	10/26-11/1 (9)	11/2-8 (10)
Swans:										
Whistling								250	1,500	1,500
Trumpeter	175	175	175	150	150	150	40	100	50	150
Geese: Total Swan	175	175	175	150	150	150	40	350	1,550	1,650
Canada	150	150	150	150	150	100	100	400	400	500
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other Total Geese	150	150	150	150	150	100	100	400	400	500
Ducks:										
Mallard	10,000	5,500	5,000	5,000	2,000	3,500	3,500	2,000	1,000	1,000
Black										
Gadwall	3,500	250	500	500	450	500	500	400		
Baldpate	20,000	20,000	30,000	40,000	40,000	20,000	4,000	4,000	3,000	3,000
Pintail	6,000	2,500	1,500	1,500	1,500	1,000	600	100		
Green-winged teal	500	500	500	500	500	500	250	200	250	250
Blue-winged teal	1,000	700	500	500	500	500				
Cinnamon teal										
Shoveler	500	300	600	600	600	500				
Wood										
Redhead	2,500	1,700	1,000	1,000	1,000	1,000	800	200	500	500
Ring-necked	700	700	250	250	250	300		100	100	100
Canvasback	600	600	500	500	300	150	150			
Scaup Lesser	1,000	200	2,000	2,000	3,500	1,500				
Goldeneye	50	10	50	50	50	50	100	250	250	250
Bufflehead	400	800	100	100	100		50	50	50	50
Ruddy	1,500	2,000	1,000	1,000						
Other Common Merg.			25	25	25					
Total Ducks	48,250	35,760	43,525	53,525	50,775	29,500	9,950	7,300	5,150	5,150
Coot:	19,500	25,000	30,000	30,000	30,000	25,000	1,000	250		

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Red Rock Lakes MONTHS OF September TO December, 1969

(1) Species	(2) Weeks of reporting period: 11/9-15 (11)	11/16-22 (12)	11/23-29 (13)	11/30-12/6 (14)	12/7-13 (15)	12/14-20 (16)	12/21-27 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	500								26,250		
Trumpeter	200	200	175	150	150	150	150		17,430		
Total Swans	700	200	175	150	150	150	150		43,680		
Geese:											
Canada	350	400	250	100					23,450		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Total Geese	350	400	250	100					23,450		
Ducks:											
Mallard	2,000	2,000	2,000	1,000	1,000	500	250		330,750		
Black									46,200		
Gadwall											
Baldpate	3,000	3,000	3,000	3,000	1,500	500	500		1,389,500		
Pintail									102,900		
Green-winged teal	150	100	100	100	100	100	100		32,900		
Blue-winged teal									25,900		
Cinnamon teal											
Shoveler									21,700		
Wood											
Redhead	200	100	50	50					74,200		
Ring-necked	50	50	50	50	25	25	25		21,175		
Canvasback									19,600		
Scaup									71,400		
Goldeneye	800	800	500	500	500	350	300		34,020		
Bufflehead	50	50	50	25	25	25	25		13,650		
Ruddy									38,500		
Common Merg.									525		
Total Ducks	6,250	6,100	5,750	4,725	3,150	1,500	1,200		2,222,920		
Coot:									1,125,250		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	43,680	1,650	
Geese	23,450	500	
Ducks	2,222,920	53,525	
Coots	1,125,250	30,000	

SUMMARY

Principal feeding areas Upper, Lower Lake and River Marsh

Principal nesting areas Over water in carex stands adjacent uplands close to marsh edge.

Reported by Ronald V. Papike

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Red Rock Lakes Months of September to December 1969

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:			Peaked During							
Eared Grebe	Previous Period		Last Period		3	10/5				200
Western Grebe	"	"	"	"	2	9/10				75
Pied-Billed Grebe	"	"	"	"	1	9/30				50
White Pelican	"	"	"	"	50	9/22				100
Double-Crested Cormorant	"	"	"	"	2	9/10				10
Great Blue Heron	"	"	"	"	1	10/8				35
Black-Crowned Night Heron	"	"	"	"	1	10/21				15
American Bittern	"	"	"	"	2	9/13				20
Sandhill Crane	"	"	"	"	10	9/28				250
Sora Rail	"	"	"	"	4	9/7				1,000
II. Shorebirds, Gulls and Terns:			Peaked During							
Killdeer	Previous Period		Last Period		2	11/2				300
Common Snipe	"	"	"	"	1	12/8				400
Willet	"	"	"	"	3	9/5				100
Greater Yellowlegs	"	"	"	"	20	9/5				20
Long-Billed Dowitcher	"	"	"	"	50	9/5				50
Western Sandpiper	"	"	"	"	200	9/30				400
Avocet	"	"	"	"	15	9/8				100
Wilson's Phalarope	"	"	"	"	250	9/30				1,000
California Gull	"	"	"	"	50	11/2				150
Franklin's Gull	"	"	"	"	10	9/10				25
Forester's Tern	"	"	"	"	5	9/12				100
Common Tern	"	"	"	"	2	9/5				100
Black Tern	"	"	"	"	1	9/21				100

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:									
Mourning dove	Previous	Period	Last Period		2	11/10			50
White-winged dove									
IV. Predaceous Birds: Bald	1	10/1	1	12/20	1	12/20			4
Golden eagle	Previous	Period	5	11/10	1	12/30			10
Duck hawk	Previous	Period	1	9/30	1	9/30			2
Horned owl	Previous	Period	10	10/5	1	11/20			10
Magpie	Previous	Period	Last Period		3	12/31			150
Raven									
Crow	Previous	Period	Last Period		2	12/25			100
Goshawk	Previous	Period	2	9/10	1	10/1			3
Sharp-Shinned Hawk	Previous	Period	1	9/2	1	10/3			2
Red-Tailed Hawk	Previous	Period	Last Period		1	11/5			12
Marsh Hawk	Previous	Period	25	10/1	1	12/28			35
Sparrow Hawk	Previous	Period	3	9/10	1	10/2			8

Reported by Ronald V. Papike

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INTERIOR--PORTLAND, OREGON

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Red Rock Lakes

Year 1969

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/4-10	76	175	Widgeon 46, Scaup 32, Gadwall 22, Mallard 11, BW Teal 11, Shoveler 9, Canvasback 7, GW Teal 7, Redhead 4, Goldeneye 3, Ruddy 2, Ring-necked 1, Bufflehead 1, C. Teal 1, Pintail 3.	163	30	193	105	267
10/11-17	5	56	Widgeon 4, Scaup 4, Mallard 2, Goldeneye 1, Ruddy , 1, Merganser 1.	13	3	16	20	64
10/18-24	2	6	Widgeon 2, Goldeneye 1, Shovelerl.	4	1	5	5	13
11/8-14	3	3	Mallard 5, Widgeon 3, GW Teal 2, Scaup 2, Goldeneye 1.	13	2	15	3	15
TOTALS	86	240	Widgeon 55, Scaup 38, Gadwall 22, Mallard 18, BW Teal 11, Shoveler 10, GW Teal 9, Canvasback 7, Goldeneye 6, Redhead 4, Ruddy 3, Pintail 3, C. Teal 1, Bufflehead 1, Ring-necked 1, Merganser 1, Unidentified 3.	193	36	229	133	359

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

80348-60

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Red Rock Lakes Months of September to December, 19 69

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Blue Grouse	Conifers 3000 acres								30	
Ruffed Grouse	Aspen-Fir-Willows 3000 acres								50	
Sage Grouse	Sage Brush, Grass 3000 acres								75	
Gray Partridge	Sage Brush, Meadows 24,000 acres								35	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES:	Use correct common name.
(2) DENSITY:	Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
(3) YOUNG PRODUCED:	Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
(4) SEX RATIO:	This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
(5) REMOVALS:	Indicate total number in each category removed during the report period.
(6) TOTAL:	Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
(7) REMARKS:	Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Red Rock Lakes Calendar Year 1969

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Black Bear												3	1	
Elk			1									100		M:F
Mule Deer			3									150	50	40:60
Moose		6	4									45	20	
Antelope		64	2									147		M29 F54 Y64

Remarks:

Reported by Ronald V. Papike

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Red Rock Lakes Year 19 69

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
							Sparrow Pond, east shoreline		150 yards	100 Scirpus acutus, rootstocks, 50 Carex rostrata, rhizomes	8/21	Unknown	

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic 150 yards shoreline
Hedgerows, cover patches
Food strips, food patches
Forest plantings

Remarks: Results to be evaluated during the 1970 summer.

76148

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Red Rock Lakes County Beaverhead State Montana

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
NONE								NONE	
								Fallow Ag. Land NONE	

No. of Permittees: Agricultural Operations NONE Haying Operations 2 Grazing Operations 19

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	5,002	12,822.04	25,644.08	25,520
				2. Other	5	15	30.00	115
				1. Total Refuge Acreage Under Cultivation				NONE
Hay - Wild	224.5	460	1,571.50	2. Acreage Cultivated as Service Operation				NONE

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.DUP.,D.C.61-88850

3-1570
NR-88
(4/54)

REFUGE GRAIN REPORT

Refuge Red Rock Lakes Months of January through December, 1969

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Wheat	2,000	1,500bu.	3,500			1,000	1,000	2,500		2,500	

(8) Indicate shipping or collection points Camas National Wildlife Refuge.

(9) Grain is stored at Culver and MacDonald Pond.

(10) Remarks supplemental winter swan feed.

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 17065

3-1755
Form NR-5
60701

DISEASE

Refuge Red Rock Lakes Year 1969

Botulism

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

NO DISEASE NOTED THIS YEAR.

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

3-1761
Form NR-11

TIMBER REMOVAL

Refuge Red Rock Lakes Year 1969

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
		NO TIMBER REMOVED THIS YEAR.						

Total acreage cut over..... Total income.....

No. of units removed B. F..... Method of slash disposal.....
Cords.....
Ties.....
.....

Interior--Duplicating Section, Washington, D. C.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Red Rock Lakes

Proposal Number:

Reporting Year: 1969

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		NO PESTICIDES WERE APPLIED THIS YEAR.						

10. Summary of results (continue on reverse side, if necessary)

INTERIOR--PORTLAND, OREGON